

## Claims:

1. A process for producing a fractionated polydisperse inulin composition from a native polydisperse inulin by a directed crystallization of an inulin solution, which comprises a rapid achievement of a high degree of super saturation obtained by bringing the native inulin into solution in water solvent at a temperature above 85 °C and by a rapid cooling by a heat exchanger to a temperature between -6 °C and 40 °C at a rate between 0.2°C and 10°C/sec, or by a rapid concentration increase through evaporation of the solvent, or by combination thereof, to provide said fractionated polydisperse inulin in the form of particles;

- separation of the particles obtained after crystallization; and
- washing of the separated particles with water to provide said fractionated polydisperse inulin composition having an average degree of polymerization which is double or higher than the average degree of polymerization of said native polydisperse inulin, containing less than 0.2 wt.% monomers and less than 0.2 wt.% dimers and less than 1.5 wt.% oligomers and less than 0.2 wt.% ash and which does not contain any detectable amount of alcohol.

2. The process according to claim 1 wherein the particles separated after crystallization are washed with demineralized water at 15°C.

3. Process according to claim 1 wherein the native polydisperse inulin composition is an already fractionated polydisperse inulin composition.

4. Process according to claim 1 wherein the process further comprises the step of drying of the washed particles.

5. Process according to claim 1, the process further comprises the step of spray drying of the washed particles.

6. Process according to claim 2 wherein the process further comprises the step of chemical or enzymatic modification of the washed particle.

7. Process according to claim 1 wherein the carbohydrate is native chicory inulin or fractionated chicory inulin.

8. Process according to claim 1 wherein grafting particles are used.

9. Process according to claim 1 comprising rapid cooling to a temperature between 15 °C and 25 °C at a rate between 1 °C and 7 °C/sec.

10. Non-chromatographically fractionated polydisperse fructan composition having:

-an average degree of polymerization which is double or higher than the average degree of polymerization of native polydisperse carbohydrate

-containing less than 0.2 wt % monomer and less than 0.2 wt % dimers and less than 1.5 wt % oligomers

-containing less than 0.2 wt % ash, and  
which does not contain any detectable amount of alcohol.

11. Composition according to claim 10 wherein the fructan composition is an inulin composition.

12. Composition according to claim 11 wherein the inulin composition is a fractionated polydisperse chicory inulin.

13. Composition according to claim 10 wherein the composition is a crystallized composition in the form of spherical particles having the following characteristics:

- diameter comprises between 1 and 100  $\mu\text{m}$
- radial symmetry, double breaking and perpendicular fade cross under polarized light.

14. Composition according to claim 10 wherein the composition is a crystallized inulin composition in the form of spherical particles having the following characteristics:

- diameter comprises between 1 and 100  $\mu\text{m}$
- radial symmetry, double breaking and perpendicular fade cross under polarized light.

15. Composition according to claim 10 in spray-dried form.

16. Composition according to claim 10 wherein the fructan composition is esterified, etherified, oxidized and/or crosslinked.
17. Composition according to claim 11 wherein the inulin composition is esterified, etherified, oxidized and/or crosslinked.
18. Composition having a creamy structure comprising the fractionated polydisperse fructan composition according to claim 10.
19. Composition having a creamy structure comprising the inulin composition according to claim 11.
20. Pelletized composition including the composition according to claim 10 which forms instantly a colloidal dispersion.
21. Pharmaceutical, cosmetical, feed and/or food composition comprising the composition according to claim 10.
22. Composition according to claim 15 wherein the fructan composition is esterified, etherified, oxidized and/or crosslinked.
23. Pharmaceutical, cosmetical, feed and/or feed composition comprising the composition according to claim 18.

24. Pharmaceutical, cosmetical, feed and/or food composition comprising the composition according to claim 20.

25. Pharmaceutical, cosmetic, feed or food composition comprising the composition according to claim 11.

26. Pharmaceutical, cosmetic, feed or food composition comprising the composition according to claim 12.

27. Pharmaceutical, cosmetic, feed or food composition comprising the composition according to claim 13.

28. Composition according to claim 11 wherein the inulin composition comprises delta inulin.

29. Pharmaceutical, cosmetic, feed or food composition comprising the composition of claim 28.